Table S1: Isotopic data for subsurface core and cuttings samples

Well	Unit	Depth	Type	$\delta^{13}C$	$\delta^{18}O$	$\delta^{34}S_{CAS}$	$\delta^{34}S_{pyr}$	Δδ
AAL1	A6C	2256.0	ctgs			38.4	-3.1	41.5
AAL1	A0C	3820.0	ctgs			39.0		
AAL1	A0C	3823.1	core				17.8	
AAL1	A0C	3829.0	core			39.7	17.1	22.6
AAL1	A0C	3838.6	core			36.1	23.3	12.8
AAL1	A0C	3845.8	core			36.2	24.2	12.0
AAL1	A0C	3852.0	ctgs			36.7		
AAL1	A0C	3952.0	ctgs			35.0		
AAL1	A0C	4000.0	ctgs			32.9		
AAL1	A0C	4052.0	ctgs			33.1		
AAL1	A0C	4096.0	ctgs			35.9		
BB4	A4C	2905.8	core	-2.7	-2.4	39.3	13.8	25.5
BB4	A4C	2907.7	core	-2.4	-2.2	38.8	12.9	25.9
BB4	A4C	2908.7	core	-2.6	-2.0		16.6	
BB4	A4C	2909.3	core	-2.6	-2.0	38.8	13.7	25.0
BB4	A4C	2910.8	core	-2.6	-2.5	38.5	18.9	19.6
BB4	A4C	2911.4	core	-2.7	-2.2	38.7	16.1	22.6
BB4	A4C	2911.5	core	-2.7	-2.5	38.9	18.2	20.7
BB4	A4C	2919.3	core	-2.6	-2.2	39.3	15.5	23.8
BB4	A4C	2925.6	core	-2.4	-3.2	38.9	15.2	23.7
BB4	A4C	2928.8	core	-2.5	-1.0	38.7	9.2	29.5
BB4	A4C	2929.4	core	-2.2	-3.1	39.3	10.4	28.9
BB4	A4C	2931.4	core	-2.8	-3.9	39.3	17.4	22.0
BB4	A4C	2932.1	core	-2.8	-3.8			
BB4	A4C	2932.9	core	-2.8	-3.3	39.7	7.7	32.0
BB4	A4C	2937.1	core	-3.1	-4.5	39.0	13.4	25.6
BB4	A4C	2937.8	core	-3.1	-4.5			
BB4	A4C	2939.8	core	-3.1	-4.2	39.6	7.1	32.5
BB4	A4C	2940.1	core	-3.1	-4.4	39.7	16.9	22.8
BB4	A4C	2940.9	core	-3.2	-4.3			
BB4	A4C	2944.7	core	-4.4	-4.2	39.2	6.1	33.0
BB4	A4C	2945.2	core	-3.9	-3.6	38.9	9.1	29.9
BB4	A4C	2945.9	core	-3.9	-4.6			
BB4	A4C	2948.6	core	-4.6	-2.9	39.4	13.3	26.1
BB4	A4C	2949.9	core	-5.0	-3.4	39.3	12.2	27.2
BB4	A4C	2950.0	core	-4.5	-3.0	39.8	15.2	24.6
BB4	A4C	2950.2	core	-4.3	-2.5	34.7	13.2	21.5
BB4	A4C	2950.6	core	-2.9	-1.8			
BB4	A3C	3029.7	core	3.3	-3.5	40.4	13.4	26.9
BB4	A3C	3032.3	core	3.2	-4.6	41.2	11.6	29.6
BB4	A3C	3033.6	core	3.2	-4.8	40.9		
BB4	A3C	3034.0	core	3.4	-4.3	40.5		
BB4	A3C	3035.0	core	3.7	-3.1	41.1	15.1	26.0
BBN1	A5C	3534.0	ctgs	-0.7	-4.9	40.5		
BBN1	A5C	3540.0	ctgs	0.8	-0.9			
BBN1	A5C	3546.0	ctgs	1.8	1.6	40.3		
BBN1	A5C	3563.0	ctgs	2.8	0.3			
BBN1	A5C	3568.0	ctgs	2.8	0.7			
BBN1	A4C	3682.0	ctgs	-6.7	-3.7	38.7		
BBN1	A4C	3685.0	ctgs	-2.6	-3.0	36.9		
BBN1	A4C	3716.0	ctgs	-2.6	-3.1	38.1		

Table S1: continued

Well	Unit	Depth	Type	$\delta^{13}C$	$\delta^{18}O$	$\delta^{34}S_{CAS}$	$\delta^{34}S_{pyr}$	Δδ
BBN1	A4C	3734.0	ctgs	-0.6	-3.5	39.6		
BBN1	A4C	3736.0	ctgs	-2.6	-3.8			
BBN1	A4C	3740.0	ctgs	-1.9	-3.5			
BBN1	A3C	3781.0	ctgs	3.3	1.8	37.9	-4.8	42.7
BBN1	A3C	3831.0	ctgs	3.2	-1.2	38.7	4.3	34.4
BBN1	A3C	3868.0	ctgs	2.6	-0.6	40.8		
BBN1	A2C	4194.0	ctgs	2.1	-0.7			
BBN1	A2C	4237.0	ctgs	0.0	-1.0			
BBN1	A2C	4259.0	ctgs	0.6	0.9			
BBN1	A2C	4264.0	ctgs	-0.5	-0.7			
BBN1	A1C	4358.0	ctgs	2.7	0.2			
DHS3	A1C	2956.6	core	2.3	1.1	34.2	7.7	26.4
DHS3	A1C	2963.5	core			34.2		
DHS3	A1C	2990.1	core	2.2	-2.9	40.6	7.6	33.0
DHS3	A1C	3000.9	core			42.8	8.9	33.9
MNH1	A6C	3394.0	ctgs	2.1	0.0	37.8		
MNH1	A6C	3410.0	ctgs	2.4	0.0	39.9	0.0	39.9
MNH1	A6C	3450.0	ctgs			37.0		
MNH1	A6C	3460.0	ctgs	2.8	0.1		10.9	
MNH1	A5C	3640.0	ctgs	2.8	0.0	40.6		
MNH1	A5C	3690.0	ctgs	2.3	0.0			
MNH1	A5C	3700.0	ctgs	2.0	0.0	37.1	2.5	34.6
MNH1	A5C	3710.0	ctgs	2.7	0.0	41.2		
MNH1	A5C	3800.0	ctgs	2.7	0.0	41.4		
MNH1	A5C	3810.0	ctgs	2.1	-3.4	39.5		
MNH1	A5C	3820.0	ctgs	2.2	-1.3	42.5		
MNH1	A3C	3960.0	ctgs			39.7		
MNH1	A3C	3976.0	core			40.4		
MNH1	A3C	3979.0	core	2.9	1.7	40.4	18.7	21.8
MNH1	A3C	3979.4	core	0.3	-4.2	41.2		
MNH1	A3C	3983.5	core	1.5	0.3	41.2	3.4	37.9
MNH1	A3C	3988.7	core			39.9		
MNH1	A2C	4171.0	core	3.4	0.6	40.1	16.5	23.6
MNH1	A2C	4176.0	core	3.4	1.4	40.5		
MNH1	A2C	4187.3	core			40.8	11.5	29.3
MNH1	A2C	4190.4	core	3.2	2.6	41.3		
MNH1	A2C	4246.0	ctgs	2.9	1.4	40.6	16.4	24.2
MNH1	A2C	4260.0	ctgs			41.3	7.7	33.5
MNH1	A1C	4496.0	ctgs	2.6	0.7	39.1	0.3	38.8
MNH1	A1C	4500.0	ctgs	2.2	0.6	37.0	-1.0	38.0
MNH1	A1C	4504.0	ctgs	2.5	0.5	36.7	-9.9	46.5
MNH1	A1C	4512.0	ctgs	3.5	0.1	36.7	-3.2	39.9
MNH1	A1C	4516.0	ctgs	1.7	0.4	36.7	-3.4	40.0
MNH1	A1C	4520.0	ctgs	1.5	0.6	38.0	0.1	37.9
MNH1	A1C	4528.0	ctgs	1.8	0.3	37.0	12.9	24.1
MQ1	A0	2906.0	ctgs	1.2	-5.2			
MQ1	A0	2926.0	ctgs	1.5	-5.1	27.3		
MQ1	A0	2958.0	ctgs	2.2	-2.5	31.8		
MQ1	A0	3018.0	ctgs	2.0	-2.1	26.7		
MQ1	A0	3026.0	ctgs	1.4	-4.3	30.2		
MQ1	A0	3070.0	ctgs	1.7	-1.7			

Table S1: continued

Well	Unit	Depth	Type	$\delta^{13}C$	$\delta^{18}O$	$\delta^{34}S_{CAS}$	$\delta^{34}S_{pyr}$	Δδ
MQ1	A0	3110.0	ctgs	2.0	-0.7	23.0		
MQ1	A0	3134.0	ctgs	2.4	-1.2	24.1		
MQ1	A0	3142.0	ctgs	1.0	-2.4	24.5		
MQ1	A0	3150.0	ctgs	1.0	-2.7	25.3		
MQ1	A0	3158.0	ctgs	0.1	-2.3	25.7		
MQ1	A0	3180.0	ctgs	2.0	-1.4	23.8		
MQ1	A0	3192.0	ctgs	2.1	-1.9	25.2		
MQ1	A0	3198.0	ctgs	2.2	-1.0	23.7		
TM6	Post-A4	1990.0	ctgs	2.1	-3.3			
TM6	Post-A4	1995.0	ctgs	2.4	-4.0			
TM6	Post-A4	2000.0	ctgs	2.5	-3.3	41.2	8.7	32.5
TM6	Post-A4	2005.0	ctgs	2.5	-3.4			
TM6	Post-A4	2010.0	ctgs	2.6	-3.5			
TM6	Post-A4	2015.0	ctgs	2.6	-2.7			
TM6	Post-A4	2020.0	ctgs	2.8	-2.8			
TM6	Post-A4	2025.0	ctgs	2.6	-2.1			
TM6	Post-A4	2030.0	ctgs	2.3	-3.7			
TM6	Post-A4	2035.0	ctgs	2.5	-3.7			
TM6	Post-A4	2040.0	ctgs	2.7	-3.9			
TM6	Post-A4	2045.0	ctgs	2.6	-3.6			
TM6	Post-A4	2050.0	ctgs	2.3	-3.4	39.6	8.5	31.1
TM6	Post-A4	2055.0	ctgs	2.5	-3.3			
TM6	Post-A4	2060.0	ctgs	2.3	-3.2			
TM6	Post-A4	2065.0	ctgs	1.7	-1.1			
TM6	Post-A4	2070.0	ctgs	1.7	-2.9			
TM6	Post-A4	2075.0	ctgs	1.9	-1.0			
TM6	A4	2080.0	ctgs	-2.7	-2.6	39.3		
TM6	A4	2085.0	ctgs	-3.1	-1.8	39.2		
TM6	A4	2090.0	ctgs	-3.1	-1.8	41.3	9.9	31.4
TM6	A4	2100.0	ctgs	-3.7	-1.4	29.7		
TM6	A4	2105.0	ctgs	-2.8	-3.3	38.9		
TM6	A4	2110.0	ctgs	-3.1	-3.0	38.2		
TM6	A4	2115.0	ctgs	-4.4	-4.2	40.7	7.9	32.8
TM6	A4	2120.0	ctgs	-2.9	-3.6	40.0	7.9	32.1
TM6	A4	2125.0	ctgs	-3.8	-3.1	40.3	11.9	28.4
TM6	Pre-A4	2130.0	ctgs	1.8	-4.1	41.1	9.4	31.7
TM6	Pre-A4	2135.0	ctgs	1.2	-2.9	38.9	8.2	30.7
TM6	Pre-A4	2140.0	ctgs	1.4	-2.8	39.6	8.8	30.8
TM6	Pre-A4	2145.0	ctgs	1.5	-2.4	39.7	9.9	29.8
TM6	Pre-A4	2150.0	ctgs	1.4	-2.7	39.0	7.6	31.4
TM6	Pre-A4	2155.0	ctgs	2.2	-2.7	39.3	9.3	30.0
TM6	Pre-A4	2160.0	ctgs	3.0	-2.2	39.7	8.7	31.0
TM6	Pre-A4	2165.0	ctgs	3.2	-3.2	40.4	10.8	29.6
TM6	Pre-A4	2170.0	ctgs	2.7	-3.0	38.7	11.4	27.3
TM6	Pre-A4	2175.0	ctgs	2.4	-3.4	38.9	10.6	28.3
TM6	Pre-A4	2180.0	ctgs	2.3	-3.4	38.9	5.5	33.4
TM6	Pre-A4	2185.0	ctgs	0.2	-5.6	39.2	10.2	29.0
TM6	Pre-A4	2190.0	ctgs	-0.2	-6.5	38.9	6.7	32.2
TM6	Pre-A4	2195.0	ctgs	0.7	-4.2	41.8	10.4	31.4
TM6	Pre-A4	2200.0	ctgs	1.8	-3.3	39.2	8.8	30.5
TM6	Pre-A4	2205.0	ctgs	1.7	-1.6	38.3	10.9	27.4

Table S1: continued

Well	Unit	Depth	Type	$\delta^{13}C$	$\delta^{18}O$	$\delta^{34}S_{CAS}$	$\delta^{34}S_{pyr}$	$\Delta\delta$
TM6	Pre-A4	2210.0	ctgs	1.9	-3.1	39.5	9.1	30.4
TM6	Pre-A4	2215.0	ctgs	1.6	-3.3	39.4	10.4	29.1
TM6	Pre-A4	2220.0	ctgs	1.5	-2.2	41.8		
TM6	Pre-A4	2225.0	ctgs	1.4	-3.0	39.8		
TM6	Pre-A4	2230.0	ctgs	-1.0	-1.9	42.4		
TM6	Pre-A4	2235.0	ctgs	-4.7	-3.5			
TM6	Pre-A4	2240.0	ctgs	0.2	-0.2	42.3		
TM6	Pre-A4	2245.0	ctgs	0.3	-0.8	41.3		
TM6	A0	2250.0	ctgs	1.0	-2.4	39.5		
TM6	A0	2255.0	ctgs	1.5	-2.5	40.2		
TM6	A0	2260.0	ctgs	1.0	-2.4	39.6		
TM6	A0	2265.0	ctgs	0.2	-1.9	40.7		
TM6	A0	2270.0	ctgs	-0.5	-1.1	40.8		
TM6	A0	2275.0	ctgs	0.0	-1.6	39.6		
TM6	A0	2280.0	ctgs	-0.1	-2.0	40.5		
TM6	A0	2285.0	ctgs	-2.0	-1.8	44.3		
TM6	A0	2290.0	ctgs	-1.7	-2.3	34.9		
TM6	A0	2295.0	ctgs	-3.4	-3.2	37.9		
TM6	A0	2300.0	ctgs	-1.1	-2.8	27.1		
TM6	A0	2305.0	ctgs	-2.0	-2.3	18.3		
TM6	A0	2310.0	ctgs	-1.8	-2.7	39.1		
TM6	A0	2315.0	ctgs	-1.1	-2.7	38.4		
TM6	A0	2320.0	ctgs	-1.2	-2.7	31.8		
TM6	A0	2325.0	ctgs	-0.2	-2.9	33.7		
TM6	A0	2330.0	ctgs	-0.2	-2.8	31.9		
TM6	A0	2335.0	ctgs	-0.9	-2.9	38.1		
TM6	A0	2340.0	ctgs	-0.8	-2.7	37.1		
TM6	Buah Fm.	2360.0	ctgs			27.8		
TM6	Buah Fm.	2370.0	ctgs	-3.2	-3.1	27.2		
TM6	Buah Fm.	2380.0	ctgs	-5.3	-3.9	31.7		
TM6	Buah Fm.	2395.0	ctgs	-0.5	-3.7	36.5		
TM6	Buah Fm.	2400.0	ctgs	-0.2	-3.3	33.0		
TM6	Buah Fm.	2410.0	ctgs	-2.0	-0.4	29.9		
TM6	Buah Fm.	2420.0	ctgs	-2.7	-3.0	8.0		
TM6	Shuram Fm.	2430.0	ctgs	-3.2	-3.5	18.1		
TM6	Shuram Fm.	2440.0	ctgs	-1.7	-4.1	27.1		
TM6	Shuram Fm.	2460.0	ctgs	-1.8	-3.5	27.0		
TM6	Shuram Fm.	2480.0	ctgs	-2.2	-3.9	14.8		
TM6	Shuram Fm.	2495.0	ctgs	-3.7	-3.7	18.6		
TM6	Shuram Fm.	2505.0	ctgs	-3.4	-4.3	23.3		
TM6	Shuram Fm.	2520.0	ctgs	-3.0	-3.4	25.7		
TM6	Shuram Fm.	2540.0	ctgs	-3.4	-3.3	13.9		